# **ANNEX 1 Key Category Analysis**

The United States has identified national key categories based on the estimates presented in this report. The IPCC's *Good Practice Guidance* (IPCC 2000) describes a key category as a "[category] that is prioritized within the national inventory system because its estimate has a significant influence on a country's total inventory of direct greenhouse gases in terms of the absolute level of emissions, the trend in emissions, or both." By definition, key categories are sources or sinks that have the greatest contribution to the absolute overall level of national emissions in any of the years covered by the time series. In addition, when an entire time series of emission estimates is prepared, a determination of key categories must also account for the influence of the trends of individual categories. Therefore, a trend assessment is conducted to identify source and sink categories for which significant uncertainty in the estimate would have considerable effects on overall emission trends. Finally, a qualitative evaluation of key categories should be performed, in order to capture any key categories that were not identified in either of the quantitative analyses, but can be considered key because of the unique country-specific estimation methods.

The methodology for conducting a key category analysis, as defined by IPCC's *Good Practice Guidance* (IPCC 2000) and IPCC's *Good Practice Guidance for Land Use, Land-Use Change, and Forestry (IPCC 2003)*, includes:

- Tier 1 approach (including both level and trend assessments);
- Tier 2 approach (including both level and trend assessments, and incorporating uncertainty analysis); and
- Qualitative approach.

This Annex presents an analysis of key categories, both for sources only and also for sources and sinks (i.e., including LULUCF); discusses Tier 1, Tier 2, and qualitative approaches to identifying key categories; provides level and trend assessment equations; and provides a brief statistical evaluation of IPCC's quantitative methodologies for defining key categories.

Table A-1 presents the key categories for the United States based on the Tier 1 approach (including and not including LULUCF categories) using emissions data in this report, and ranked according to their sector and global warming potential-weighted emissions in 2005. The table also indicates the criteria used in identifying these source and sink categories (i.e., level, trend, and/or qualitative assessments).

Table A-1: Key Source Categories for the United States (1990-2005) Based on Tier 1 Approach

		Level Without	Trend Without	Level With	Trend With		2005 Emissions
IPCC Source Categories	Gas	LULUCF	LULUCF	LULUCF	LULUCF	Quala	(Tg CO <sub>2</sub> Eq.)
Energy CO <sub>2</sub> Emissions from Stationary Combustion – Coal	CO <sub>2</sub>	✓	✓	✓	✓		2,093.6
Mobile Combustion: Road & Other	$CO_2$	✓	✓	✓	✓		1,642.9
CO <sub>2</sub> Emissions from Stationary Combustion – Gas	$CO_2$	✓		✓			1,138.2
CO <sub>2</sub> Emissions from Stationary Combustion – Oil	$CO_2$	✓	✓	✓	✓		626.3
Mobile Combustion: Aviation	$CO_2$	✓	✓	✓	✓		186.1
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	$CO_2$	✓		✓	✓		142.4
Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	✓	✓	✓	✓		111.1
International Bunker Fuels <sup>b</sup>	Several					✓	98.2
Mobile Combustion: Marine	CO <sub>2</sub>	✓	✓	✓	✓		63.7
Fugitive Emissions from Coal Mining	CH <sub>4</sub>	✓	✓	✓	✓		52.4
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	✓	✓	✓	✓		28.5

CO <sub>2</sub> Emissions from Natural Gas Systems	CO <sub>2</sub>	✓	1	✓	✓	28.2
CO <sub>2</sub> Emissions from Waste Combustion	$CO_2$		✓		<b>√</b>	20.9
Mobile Combustion: Road and Other	$N_2O$	✓	✓	✓	✓	13.8
Industrial Processes Emissions from Substitutes for Ozone Depleting Substances	Several	✓	✓	✓	✓	123.3
CO <sub>2</sub> Emissions from Cement Manufacture	$CO_2$	✓	✓	✓	✓	45.9
CO <sub>2</sub> Emissions from Iron and Steel Production	$CO_2$	✓	✓	✓	✓	45.2
HFC-23 Emissions from HCFC-22 Manufacture	HFCs	✓	✓	✓	✓	16.5
CO <sub>2</sub> Emissions from Ammonia Manufacture and Urea Application	CO <sub>2</sub>		✓		✓	16.3
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	SF <sub>6</sub>		✓		✓	13.2
N <sub>2</sub> O Emissions from Adipic Acid Production	$N_2O$		✓		✓	6.0
PFC Emissions from Aluminum Production	PFCs		✓		✓	3.0
Agriculture Direct N₂O Emissions from Agricultural Soils	N <sub>2</sub> O	✓	✓	✓	✓	310.5
CH <sub>4</sub> Emissions from Enteric Fermentation in Domestic Livestock	CH <sub>4</sub>	✓	✓	✓	✓	112.1
Indirect N <sub>2</sub> O Emissions from Nitrogen Used in Agriculture	$N_2O$	✓	✓	✓	✓	54.6
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>			✓		9.5
Waste CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	✓	✓	✓	✓	132.0
Land Use, Land-Use Change, and Forestry CO <sub>2</sub> Emissions from Forest Land Remaining Forest Land	CO <sub>2</sub>			✓		(698.7)
CO <sub>2</sub> Emissions from Settlements Remaining Settlements	$CO_2$			✓	✓	(88.5)
CO <sub>2</sub> Emissions from Cropland Remaining Cropland	$CO_2$			✓	✓	(39.4)
CO <sub>2</sub> Emissions from Grassland Remaining Grassland	$CO_2$				✓	16.1
CO <sub>2</sub> Emissions from Landfilled Yard Trimmings and Food Scraps	CO <sub>2</sub>				✓	(8.8)
Subtotal Without LULUCF						7,036.4
Total Emissions Without LULUCF Percent of Total Without LULUCF						7,241.5 97.2%
Subtotal With LULUCF						6,217.0
Total Emissions With LULUCF Percent of Total With LULUCF						6,431.9 96.7%

<sup>&</sup>lt;sup>a</sup>Qualitative criteria.

Note: The Tier 1 approach for identifying key source categories does not directly include assessment of uncertainty in emissions estimates.

Table A-2 provides a complete listing of source categories by IPCC sector, along with comments on the criteria used in identifying key categories, without LULUCF sources and sinks. Similarly, Table A-3 provides a complete listing of source and sink categories by IPCC sector, along with comments on the criteria used in identifying key categories, including LULUCF sources and sinks. The comments refer specifically to the year(s) over the course of the entire inventory time series (i.e., 1990 to 2005) in which each source category reached the threshold for being a key source based on a Tier 1 level assessment.

In addition to conducting Tier 1 level and trend assessments, a qualitative assessment of the source and sink categories, as described in the IPCC's *Good Practice Guidance* (IPCC 2000), was conducted to capture any key categories that were not identified by either quantitative method. One additional key category, international bunker fuels, was identified using this qualitative assessment. International bunker fuels are fuels consumed for aviation or marine international transport activities, and emissions from these fuels are reported separately from totals in accordance with IPCC guidelines. If these emissions were included in the totals, bunker fuels would qualify as a

bEmissions from this source not included in totals.

key category according to the Tier 1 approach. The amount of uncertainty associated with estimation of emissions from international bunker fuels also supports the qualification of this source category as key.

Following the text of this Annex, Table A-3 through Table A-7 contain the 1990 and 2005 level assessments for both with and without LULCF sources and sinks, and contain further detail on where each source falls within the analysis. Table A-8 and Table A-9 detail the "with LULUCF" and "without LULUCF" trend assessments for 1990 through 2005.

Table A-2: U.S Greenhouse Gas Inventory Source Categories without LULUCF

PPCC Source Categories	Table A-2: U.S Greenhouse Gas Inventory Source Cate		VITNOUT LULUCE 2005	Key		
					ID	
CO₂ Emissions from Stationary Combustion - Coal         CO₂         2,093.6         ✓         L,T         Level in 1990 and 2005           Mobile Combustion: Road & Other         CO₂         1,642.9         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Stationary Combustion - Oil         CO₂         626.3         ✓         L,T         Level in 1990 and 2005           Mobile Combustion: Aviation         CO₂         186.1         ✓         L,T         Level in 1990 and 2005           Mobile Combustion: Aviation         CO₂         142.4         ✓         L         Level in 1990 and 2005           Mobile Combustion: Marine         CO₂         63.7         ✓         L,T         Level in 1990 and 2005           Mobile Combustion: Marine         CO₂         28.2         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Natural Gas Systems         CO₂         20.9         ✓         T         Level in 1990 and 2005           CO₂ Emissions from Natural Gas Systems         CH₄         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Natural Gas Systems         CH₄         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Coal Mining         CH₄		ОПО	(Tg CO <sub>2</sub> Eq.)	Flag?	Criteria	Comments
Mobile Combustion: Road & Other         CO₂         1,642.9         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Stationary Combustion - Oil         CO₂         626.3         ✓         L,T         Level in 1990 and 2005           Mobile Combustion: Aviation         CO₂         626.3         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Non-Energy Use of Fuels         CO₂         186.1         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Non-Energy Use of Fuels         CO₂         142.4         ✓         L         Level in 1990 and 2005           CO₂ Emissions from Natural Gas Systems         CO₂         28.2         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Waste Combustion         CO₂         20.9         ✓         T         Level in 1990 and 2005           CO₂ Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Detrole						
CO2 Emissions from Stationary Combustion - Gas  CO2 1,138.2	CO <sub>2</sub> Emissions from Stationary Combustion - Coal	$CO_2$	2,093.6	✓	L,T	Level in 1990 and 2005
CO₂ Emissions from Stationary Combustion - Oil CO₂ 626.3	Mobile Combustion: Road & Other	$CO_2$	1,642.9	✓	L,T	Level in 1990 and 2005
Mobile Combustion: Aviation         CO₂         186.1         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Non-Energy Use of Fuels         CO₂         142.4         ✓         L         Level in 1990 and 2005           Mobile Combustion: Marine         CO₂         63.7         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Natural Gas Systems         CO₂         28.2         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Stationary Combustion - Geothermal Energy         CO₂         0.4         L,T         Level in 1990 and 2005           Fugitive Emissions from Stationary Combustion - Geothermal Energy         CO₂         0.4         L,T         Level in 1990 and 2005           Fugitive Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Non-Co₂ Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Mobile Combustion: Aviation Mobile Comb	CO <sub>2</sub> Emissions from Stationary Combustion - Gas	$CO_2$	1,138.2	✓	L	Level in 1990 and 2005
CO₂ Emissions from Non-Energy Use of Fuels  CO₂ 142.4	CO <sub>2</sub> Emissions from Stationary Combustion - Oil	$CO_2$	626.3	✓	L,T	Level in 1990 and 2005
Mobile Combustion: Marine         CO₂         63.7         ✓         L,T         Level in 1990 and 2005           CO₂ Emissions from Natural Gas Systems         CO₂         28.2         ✓         L,T         Level in 1990           CO₂ Emissions from Waste Combustion         CO₂         20.9         ✓         T           CO₂ Emissions from Stationary Combustion - Geothermal Energy         CO₂         0.4         T           Fugitive Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Coal Mining         CH4         52.4         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Stationary Combustion         CH4         6.9         FUT         Level in 1990 and 2005           Fugitive Emissions from Stationary Combustion         CH4         5.5         L,T         Level in 1990 and 2005           Mobile Combustion: Narine         N20         35.7         ✓         L,T         Level in 1990	Mobile Combustion: Aviation	$CO_2$	186.1	✓	L,T	Level in 1990 and 2005
CO₂ Emissions from Natural Gas Systems  CO₂ 28.2	CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	CO <sub>2</sub>	142.4	✓	L	Level in 1990 and 2005
CO₂ Emissions from Natural Gas Systems         CO₂         28.2         ✓         L,T         Level in 1990           CO₂ Emissions from Waste Combustion         CO₂         20.9         ✓         T           CO₂ Emissions from Stationary Combustion - Geothermal Energy         CO₂         0.4         T           Fugitive Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Coal Mining         CH4         52.4         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Patroleum Systems         CH4         6.9         ✓         L,T         Level in 1990 and 2005           Non-CO₂ Emissions from Abandoned Coal Mines         CH4         5.5         ✓         L,T         Level in 1990           Mobile Combustion: Aviation         CH4         0.1         O.1         O.1         O.1         O.1           Mobile Combustion: Aviation         N₂O         0.18         O.4         O.4         O.4	Mobile Combustion: Marine	$CO_2$	63.7	✓	L,T	Level in 1990 and 2005
CO₂ Emissions from Waste Combustion         CO₂         20.9         ✓         T           CO₂ Emissions from Stationary Combustion - Geothermal Energy         CO₂         0.4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Natural Gas Systems         CH4         111.1         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         28.5         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         6.9         ✓         L,T         Level in 1990 and 2005           Fugitive Emissions from Petroleum Systems         CH4         6.9         ✓         L,T         Level in 1990 and 2005           Non-CO₂ Emissions from Abandoned Coal Mines         CH4         5.5         ✓         L,T         Level in 1990           Mobile Combustion: Road & Other         CH4         0.1         0.1         0.1         0.1           Mobile Combustion: Road & Other         N₂O         35.7         ✓         L,T         Level in 1990           Non-CO₂ Emissions from Stationary Combustion         N₂O         0.5         N₂O         1.8           Mobile Combustion: Aviation         N₂O         0.5         N₂O         0	CO <sub>2</sub> Emissions from Natural Gas Systems	CO <sub>2</sub>	28.2	✓		
CO2 Emissions from Stationary Combustion - Geothermal Energy  Fugitive Emissions from Natural Gas Systems  CH4  Tutl 11.1  LT Level in 1990 and 2005  Fugitive Emissions from Coal Mining  CH4  Energy  CH4  CH4  CH4  CH4  CH4  CH4  CH4  CH	CO <sub>2</sub> Emissions from Waste Combustion	CO <sub>2</sub>	20.9	✓		2010 1000
Fugitive Emissions from Coal Mining CH4 52.4    Fugitive Emissions from Petroleum Systems CH4 28.5    Fugitive Emissions from Petroleum Systems CH4 6.9    Non-Co2 Emissions from Stationary Combustion CH4 6.9    Fugitive Emissions from Abandoned Coal Mines CH4 5.5    Mobile Combustion: Road & Other CH4 0.1    Mobile Combustion: Aviation CH4 0.1    Mobile Combustion: Road & Other N20 35.7    Non-Co2 Emissions from Stationary Combustion N20 13.8    Mobile Combustion: Aviation N20 13.8    Mobile Combustion: Aviation N20 13.8    Mobile Combustion: Aviation N20 1.8    Mobile Combustion: Marine N20 0.5    N20 Emissions from Waste Combustion N20 0.4    International Bunker Fuels* Several 98.2    Industrial Processes  CO2 Emissions from Cement Manufacture CO2 45.9    CO2 Emissions from Manufacture and Urea Application CO2 16.3    Application CO2 Emissions from Ammonia Manufacture CO2 13.7    CO2 Emissions from Lime Manufacture CO2 13.7    CO2 Emissions from Minimum Production CO2 4.2    CO2 Emissions from Mulminum Production CO2 4.2    CO2 Emissions from Mulminum Production CO2 4.2    CO2 Emissions from Mulminum Production CO2 1.4    CO2 Emissions from Phosphoric Acid Production CO2 1.4    CO2 Emissions from Ferroalloy Production CO2 1.4    CO3 Emissions from Ferroalloy Production CO2 1.3    C	<u>_</u>	CO <sub>2</sub>	0.4		·	
Fugitive Emissions from Petroleum Systems  CH4  ROPE Production  Fugitive Emissions from Stationary Combustion  Non-CO2 Emissions from Abandoned Coal Mines  Non-CO2 Emissions from Abandoned Coal Mines  Mobile Combustion: Road & Other  CH4  CH4  CH4  CH4  CH4  CH4  CH4  CH	Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	111.1	✓	L,T	Level in 1990 and 2005
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Mobile Combustion: Marine       CH4       0.1         Mobile Combustion: Road & Other       N₂O       35.7       ✓       L,T       Level in 1990         Non-CO₂ Emissions from Stationary Combustion       N₂O       13.8         Mobile Combustion: Aviation       N₂O       1.8         Mobile Combustion: Marine       N₂O       0.5         N₂O Emissions from Waste Combustion       N₂O       0.4         International Bunker Fuels³       Several       98.2       ✓       Q         Industrial Processes       CO₂ Emissions from Cement Manufacture       CO₂       45.9       ✓       L,T       Level in 2005         CO₂ Emissions from Iron and Steel Production       CO₂       45.2       ✓       L,T       Level in 1990 and 2005         CO₂ Emissions from Ammonia Manufacture and Urea       CO₂       16.3       ✓       T       Level in 1990 and 2005         CO₂ Emissions from Lime Manufacture       CO₂       16.3       ✓       T       Level in 1990 and 2005         CO₂ Emissions from Limestone and Dolomite Use       CO₂       16.3       ✓       T       T         CO₂ Emissions from Aluminum Production       CO₂       7.4       CO₂       2       2         CO₂ Emissions from Petrochemical Production       CO₂						
Mobile Combustion: Road & Other       N₂O       35.7       ✓       L,T       Level in 1990         Non-CO₂ Emissions from Stationary Combustion       N₂O       13.8         Mobile Combustion: Aviation       N₂O       1.8         Mobile Combustion: Marine       N₂O       0.5         N₂O Emissions from Waste Combustion       N₂O       0.4         International Bunker Fuels³       Several       98.2       ✓         Industrial Processes       CO₂ Emissions from Cement Manufacture       CO₂       45.9       ✓       L,T       Level in 2005         CO₂ Emissions from Iron and Steel Production       CO₂       45.9       ✓       L,T       Level in 1990 and 2005         CO₂ Emissions from Iron Ammonia Manufacture and Urea       CO₂       45.2       ✓       L,T       Level in 1990 and 2005         CO₂ Emissions from Lime Manufacture and Urea       CO₂       16.3       ✓       T         CO₂ Emissions from Lime Manufacture       CO₂       13.7       T         CO₂ Emissions from Aluminum Production       CO₂       7.4         CO₂ Emissions from Soda Ash Manufacture and Consumption       CO₂       4.2         CO₂ Emissions from Petrochemical Production       CO₂       2.9         CO₂ Emissions from Petrochemical Production       CO						
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Mobile Combustion: Aviation       N₂O       1.8         Mobile Combustion: Marine       N₂O       0.5         N₂O Emissions from Waste Combustion       N₂O       0.4         International Bunker Fuels³       Several       98.2       ✓       Q         Industrial Processes       CO₂ Emissions from Cement Manufacture       CO₂       45.9       ✓       L,T       Level in 2005         CO₂ Emissions from Iron and Steel Production       CO₂       45.2       ✓       L,T       Level in 1990 and 2005         CO₂ Emissions from Ammonia Manufacture and Urea       CO₂       16.3       ✓       T         Application       CO₂ Emissions from Lime Manufacture       CO₂       13.7         CO₂ Emissions from Lime Manufacture       CO₂       7.4         CO₂ Emissions from Aluminum Production       CO₂       7.4         CO₂ Emissions from Soda Ash Manufacture and Consumption       CO₂       4.2         CO₂ Emissions from Petrochemical Production       CO₂       1.9         CO₂ Emissions from Phosphoric Acid Production       CO₂       1.4         CO₂ Emissions from Ferroalloy Production       CO₂       1.4         CO₂ Emissions from Ferroalloy Production       CO₂       1.4         CO₂ Emissions from CO₂ Consumption       CO₂ </td <td></td> <td></td> <td></td> <td>•</td> <td>L, I</td> <td>Level in 1990</td>				•	L, I	Level in 1990
Mobile Combustion: Marine N₂O Emissions from Waste CombustionN₂O N₂O N₂O Emissions from Waste CombustionN₂O O.4 N₂O O.4International Bunker Fuels³Several98.2✓ QIndustrial ProcessesCO₂ Emissions from Cement ManufactureCO₂ A5.9✓ L,TLevel in 2005CO₂ Emissions from Iron and Steel ProductionCO₂ A5.2✓ L,TLevel in 1990 and 2005CO₂ Emissions from Ammonia Manufacture and Urea 						
International Bunker Fuelsa       Several       98.2       ✓       Q         Industrial Processes       CO₂ Emissions from Cement Manufacture       CO₂ Emissions from Cement Manufacture       CO₂ Emissions from Iron and Steel Production       CO₂ Emissions from Iron and Steel Production       CO₂ Emissions from Ammonia Manufacture and Urea       CO₂ Emissions from Ammonia Manufacture and Urea       CO₂ Emissions from Lime Manufacture       CO₂ Emissions from Lime Manufacture       CO₂ Emissions from Limestone and Dolomite Use       CO₂ Emissions from Aluminum Production       CO₂ Emissions from Aluminum Production       CO₂ Emissions from Petrochemical Production       CO₂ Emissions from Petrochemical Production       CO₂ Emissions from Phosphoric Acid Production       CO₂ Emissions from Phosphoric Acid Production       CO₂ Emissions from Ferroalloy Production       CO₂ Emissions from CO₂ Consumption       CO₂ Emissions from CO₂ Consumption						
Industrial Processes  CO₂ Emissions from Cement Manufacture  CO₂ Emissions from Iron and Steel Production  CO₂ Emissions from Iron and Steel Production  CO₂ Emissions from Ammonia Manufacture and Urea Application  CO₂ Emissions from Lime Manufacture  CO₂ T.4  CO₂ Emissions from Aluminum Production  CO₂ 4.2  CO₂ Emissions from Soda Ash Manufacture and Consumption  CO₂ 4.2  CO₂ Emissions from Petrochemical Production  CO₂ 2.9  CO₂ Emissions from Titanium Dioxide Production  CO₂ 1.9  CO₂ Emissions from Phosphoric Acid Production  CO₂ 1.4  CO₂ Emissions from Ferroalloy Production  CO₂ 1.4  CO₂ Emissions from Ferroalloy Production  CO₂ 1.4  CO₂ Emissions from Ferroalloy Production  CO₂ 1.4  CO₂ Emissions from CO₂ Consumption  CO₂ 1.3	N <sub>2</sub> O Emissions from Waste Combustion	$N_2O$				
CO₂ Emissions from Cement Manufacture  CO₂ Emissions from Iron and Steel Production  CO₂ Emissions from Iron and Steel Production  CO₂ Emissions from Ammonia Manufacture and Urea Application  CO₂ If Emissions from Lime Manufacture  CO₂ If Emissions from Lime Manufacture  CO₂ If Emissions from Lime Manufacture  CO₂ Emissions from Limestone and Dolomite Use  CO₂ If Emissions from Aluminum Production  CO₂ If Emissions from Soda Ash Manufacture and Consumption  CO₂ If Emissions from Petrochemical Production  CO₂ If Emissions from Petrochemical Production  CO₂ If Emissions from Posphoric Acid Production  CO₂ If Emissions from Phosphoric Acid Production  CO₂ If If If CO₂ If If If CO₂ If If If CO₂ If	International Bunker Fuelsa	Several	98.2	✓	Q	
CO2 Emissions from Iron and Steel Production  CO2 Emissions from Ammonia Manufacture and Urea Application  CO2 Emissions from Lime Manufacture  CO2 Emissions from Lime Manufacture  CO2 Emissions from Lime Manufacture  CO2 Emissions from Limestone and Dolomite Use  CO2 Emissions from Aluminum Production  CO2 Emissions from Soda Ash Manufacture and Consumption  CO2 Emissions from Petrochemical Production  CO2 Emissions from Petrochemical Production  CO2 Emissions from Titanium Dioxide Production  CO2 Emissions from Phosphoric Acid Production  CO2 Emissions from Phosphoric Acid Production  CO2 Emissions from Ferroalloy Production  CO2 Emissions from Ferroalloy Production  CO2 Emissions from CO2 Consumption  CO2 I.4  CO2 Emissions from CO2 Consumption  CO2 I.3	Industrial Processes					
CO2 Emissions from Ammonia Manufacture and Urea Application CO2 Emissions from Lime Manufacture CO2 Emissions from Lime Manufacture CO2 Emissions from Limestone and Dolomite Use CO2 Emissions from Aluminum Production CO2 Emissions from Soda Ash Manufacture and Consumption CO2 Emissions from Petrochemical Production CO2 Emissions from Petrochemical Production CO2 Emissions from Titanium Dioxide Production CO2 Emissions from Phosphoric Acid Production CO2 Emissions from Phosphoric Acid Production CO2 Emissions from Ferroalloy Production CO2 Emissions from Ferroalloy Production CO2 Emissions from CO2 Consumption CO2 Emissions from CO2 Consumption CO2 I.3	CO <sub>2</sub> Emissions from Cement Manufacture	$CO_2$	45.9	✓	L,T	Level in 2005
Application  CO2	CO <sub>2</sub> Emissions from Iron and Steel Production	$CO_2$	45.2	✓	L,T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Lime Manufacture  CO <sub>2</sub> Emissions from Limestone and Dolomite Use  CO <sub>2</sub> Emissions from Aluminum Production  CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption  CO <sub>2</sub> Emissions from Petrochemical Production  CO <sub>2</sub> Emissions from Titanium Dioxide Production  CO <sub>2</sub> Emissions from Phosphoric Acid Production  CO <sub>2</sub> Emissions from Phosphoric Acid Production  CO <sub>2</sub> Emissions from Ferroalloy Production  CO <sub>2</sub> Emissions from Ferroalloy Production  CO <sub>2</sub> Emissions from Ferroalloy Production  CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption  CO <sub>2</sub> I.4		CO <sub>2</sub>	16.3	✓	Т	
CO <sub>2</sub> Emissions from Aluminum Production CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption CO <sub>2</sub> Emissions from Petrochemical Production CO <sub>2</sub> Emissions from Titanium Dioxide Production CO <sub>2</sub> Emissions from Phosphoric Acid Production CO <sub>2</sub> Emissions from Phosphoric Acid Production CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>3</sub> Emissions from CO <sub>4</sub> Consumption CO <sub>5</sub> Emissions from CO <sub>6</sub> Consumption CO <sub>7</sub> Emissions from CO <sub>7</sub> Consumption CO <sub>8</sub> Emissions from CO <sub>8</sub> Consumption CO <sub>8</sub> Emissions from CO <sub>9</sub> Consumption CO <sub>9</sub> Emissions from CO <sub>9</sub> Consumption CO <sub>9</sub> Emissions from CO <sub>9</sub> Consumption CO <sub>9</sub> Emissions from CO <sub>9</sub> Consumption		$CO_2$	13.7		•	
CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption CO <sub>2</sub> 4.2 CO <sub>2</sub> Emissions from Petrochemical Production CO <sub>2</sub> 2.9 CO <sub>2</sub> Emissions from Titanium Dioxide Production CO <sub>2</sub> 1.9 CO <sub>2</sub> Emissions from Phosphoric Acid Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> 1.3	CO <sub>2</sub> Emissions from Limestone and Dolomite Use					
CO <sub>2</sub> Emissions from Petrochemical Production CO <sub>2</sub> Emissions from Titanium Dioxide Production CO <sub>2</sub> Emissions from Phosphoric Acid Production CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> 1.3	<del>-</del>					
CO <sub>2</sub> Emissions from Titanium Dioxide Production CO <sub>2</sub> 1.9 CO <sub>2</sub> Emissions from Phosphoric Acid Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> 1.3						
CO <sub>2</sub> Emissions from Phosphoric Acid Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> 1.3						
CO <sub>2</sub> Emissions from Ferroalloy Production CO <sub>2</sub> 1.4 CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> 1.3						
CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption CO <sub>2</sub> 1.3						
	CO <sub>2</sub> Emissions from Zinc Production	CO <sub>2</sub>	0.5			

CO <sub>2</sub> Emissions from Lead Production	CO <sub>2</sub>	0.3			
CO <sub>2</sub> Emissions from Silicon Carbide Production and	CO <sub>2</sub>	0.2			
Consumption	<del>-</del>				
CH <sub>4</sub> Emissions from Petrochemical Production	CH₄	1.1			
CH <sub>4</sub> Emissions from Iron and Steel Production CH <sub>4</sub> Emissions from Silicon Carbide Production and	CH <sub>4</sub>	1.0			
Consumption	CH <sub>4</sub>	+			
CH <sub>4</sub> Emissions from Ferroalloy Production	CH₄	+			
N <sub>2</sub> O Emissions from Nitric Acid Production	N <sub>2</sub> O	15.7			
N <sub>2</sub> O Emissions from Adipic Acid Production	N <sub>2</sub> O	6.0	✓	Т	
N <sub>2</sub> O Emissions from N <sub>2</sub> O Product Usage	N <sub>2</sub> O	4.3	•	1	
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	123.3	✓		
			•	L,T	Level in 2005
HFC-23 Emissions from HCFC-22 Production	HiGWP	16.5	✓	L,T	Level in 1990
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	HiGWP	13.2	✓	Т	
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor	LEOME	4.0		•	
Manufacture	HiGWP	4.3			
PFC Emissions from Aluminum Production	HiGWP	3.0	✓	Т	
SF <sub>6</sub> Emissions from Magnesium Production and Processing	HiGWP	2.7			
Agriculture					
CH <sub>4</sub> Emissions from Enteric Fermentation in Domestic			1		
Livestock	CH <sub>4</sub>	112.1	•	L,T	Level in 1990 and 2005
CH <sub>4</sub> Emissions from Manure Management	CH₄	41.3			
CH <sub>4</sub> Emissions from Rice Cultivation	CH₄	6.9			
CH <sub>4</sub> Emissions from Field Burning of Agricultural Residues	CH <sub>4</sub>	0.9			
Direct N <sub>2</sub> O Emissions from Agricultural Soil Management	$N_2O$	310.5	$\checkmark$	L,T	Level in 1990 and 2005
Indirect N₂O Emissions from Applied Nitrogen	$N_2O$	54.6	✓	L.T	Level in 1990 and 2005
N <sub>2</sub> O Emissions from Manure Management	N <sub>2</sub> O	9.5		-, .	2010 1000 0 2000
N <sub>2</sub> O Emissions from Field Burning of Agricultural Residues	N <sub>2</sub> O	0.5			
Waste					_
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	132.0	✓	L.T	Level in 1990 and 2005
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	25.4		-, 1	20101111 1000 4114 2000
N <sub>2</sub> O Emissions from Wastewater Treatment	N <sub>2</sub> O	8.0			
a Emissions from these sources not included in totals		*.*			

 $<sup>^{\</sup>rm a}$  Emissions from these sources not included in totals. + Does not exceed 0.05 Tg CO  $_{\rm 2}$  Eq.

Note: LULUCF sources and sinks are not included in this analysis.

Note: The Tier 1 approach for identifying key categories does not directly include assessment of uncertainty in emission estimates.

Table A-3: U.S Greenhouse Gas Inventory Source Categories with LULUCF

		2005	Key Source		
IDCC Service Cetemories	Direct GHG	Emissions	Category	ID Criteria	Commonto
IPCC Source Categories Energy	ОПО	(Tg CO₂ Eq.)	Flag?	Criteria	Comments
CO <sub>2</sub> Emissions from Stationary Combustion - Coal	CO <sub>2</sub>	2,093.6	✓	L,T	Level in 1990 and 2005
Mobile Combustion: Road & Other	$CO_2$	1,642.9	✓	L,T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	$CO_2$	1,138.2	✓	L	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	$CO_2$	626.3	✓	L,T	Level in 1990 and 2005
Mobile Combustion: Aviation	$CO_2$	186.1	✓	L,T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	$CO_2$	142.4	✓	L,T	Level in 1990 and 2005
Mobile Combustion: Marine	$CO_2$	63.7	✓	L,T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Natural Gas Systems	$CO_2$	28.2	✓	L,T	Level in 1990
CO <sub>2</sub> Emissions from Waste Combustion	$CO_2$	20.9	✓	Т	
CO <sub>2</sub> Emissions from Stationary Combustion - Geothermal Energy	CO <sub>2</sub>	0.4			

Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	111.1	✓	L,T	Level in 1990 and 2005
Fugitive Emissions from Coal Mining	CH <sub>4</sub>	52.4	✓	L,T	Level in 1990 and 2005
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	28.5	✓	L,T	Level in 1990
Non-CO <sub>2</sub> Emissions from Stationary Combustion	CH <sub>4</sub>	6.9		•	
Fugitive Emissions from Abandoned Coal Mines	CH₄	5.5			
Mobile Combustion: Road & Other	CH <sub>4</sub>	2.4			
Mobile Combustion: Aviation	CH <sub>4</sub>	0.1			
Mobile Combustion: Marine	CH <sub>4</sub>	0.1	,		
Mobile Combustion: Road & Other	N <sub>2</sub> O	35.7	✓	L,T	Level in 1990
Non-CO <sub>2</sub> Emissions from Stationary Combustion	N <sub>2</sub> O	13.8			
Mobile Combustion: Aviation Mobile Combustion: Marine	N₂O N₂O	1.8 0.5			
N <sub>2</sub> O Emissions from Waste Combustion	N <sub>2</sub> O	0.4			
International Bunker Fuels <sup>a</sup>	Several	98.2	✓	Q	
ndustrial Processes	0010101	00.2	•	Q	
CO <sub>2</sub> Emissions from Cement Manufacture	CO <sub>2</sub>	45.9	✓	L.T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Iron and Steel Production	CO <sub>2</sub>	45.2	✓	L.T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Ammonia Manufacture and Urea			· ✓	∟, ı	Level III 1930 allu 2003
Application	CO <sub>2</sub>	16.3	•	Т	
CO <sub>2</sub> Emissions from Lime Manufacture	CO <sub>2</sub>	13.7			
CO <sub>2</sub> Emissions from Limestone and Dolomite Use	CO <sub>2</sub>	7.4			
CO <sub>2</sub> Emissions from Aluminum Production	CO <sub>2</sub>	4.2			
CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption CO <sub>2</sub> Emissions from Petrochemical Production	$CO_2$ $CO_2$	4.2 2.9			
CO <sub>2</sub> Emissions from Titanium Dioxide Production	CO <sub>2</sub>	1.9			
CO <sub>2</sub> Emissions from Phosphoric Acid Production	CO <sub>2</sub>	1.4			
CO <sub>2</sub> Emissions from Ferroalloy Production	CO <sub>2</sub>	1.4			
CO <sub>2</sub> Emissions from CO <sub>2</sub> Consumption	$CO_2$	1.3			
CO <sub>2</sub> Emissions from Zinc Production	$CO_2$	0.5			
CO <sub>2</sub> Emissions from Lead Production	$CO_2$	0.3			
CO <sub>2</sub> Emissions from Silicon Carbide Production and	CO <sub>2</sub>	0.2			
Consumption CH <sub>4</sub> Emissions from Petrochemical Production	CH <sub>4</sub>	1.1			
CH <sub>4</sub> Emissions from Iron and Steel Production	CH <sub>4</sub>	1.0			
CH <sub>4</sub> Emissions from Silicon Carbide Production and					
Consumption	CH <sub>4</sub>	+			
CH <sub>4</sub> Emissions from Ferroalloy Production	CH <sub>4</sub>	+			
N <sub>2</sub> O Emissions from Nitric Acid Production	$N_2O$	15.7			
N <sub>2</sub> O Emissions from Adipic Acid Production	$N_2O$	6.0	✓	T	
N <sub>2</sub> O Emissions from N <sub>2</sub> O Product Usage	$N_2O$	4.3			
Emissions from Substitutes for Ozone Depleting Substances	HiGWP	123.3	✓	L,T	Level in 2005
HFC-23 Emissions from HCFC-22 Production	HiGWP	16.5	✓	L,T	Level in 1990
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	HiGWP	13.2	✓	Т	
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor Manufacture	HiGWP	4.3			
PFC Emissions from Aluminum Production	HiGWP	3.0	✓	Т	
SF <sub>6</sub> Emissions from Magnesium Production and Processing	HiGWP	2.7		•	
Agriculture					
CH <sub>4</sub> Emissions from Enteric Fermentation in Domestic	CH.	110.1	✓		Lovelin 1000 and 2005
Livestock	CH <sub>4</sub>	112.1		L,T	Level in 1990 and 2005
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>	41.3	✓	L	Level in 1990 and 2005
CH <sub>4</sub> Emissions from Rice Cultivation	CH <sub>4</sub>	6.9			
CH <sub>4</sub> Emissions from Field Burning of Agricultural Residues	CH <sub>4</sub>	0.9			

Indirect N <sub>2</sub> O Emissions from Applied Nitrogen	N <sub>2</sub> O	54.6	<b>√</b>	L,T	Level in 1990 and 2005
N <sub>2</sub> O Emissions from Manure Management	N <sub>2</sub> O	9.5		-, ·	2000 and 2000
N <sub>2</sub> O Emissions from Field Burning of Agricultural Residues	N <sub>2</sub> O	0.5			
Waste					
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	132.0	✓	L,T	Level in 1990 and 2005
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	25.4			
N <sub>2</sub> O Emissions from Wastewater Treatment	$N_2O$	8.0			
Land Use, Land-Use Change, and Forestry					
CO <sub>2</sub> Emissions from Forest Land Remaining Forest Land	$CO_2$	(698.7)	✓	L	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Settlements Remaining Settlements	$CO_2$	(88.5)	✓	L,T	Level in 1990 and 2005
CO <sub>2</sub> Emissions from Cropland Remaining Cropland	CO <sub>2</sub>	(39.4)	✓	L.T	Level in 2005
CO <sub>2</sub> Emissions from Land Converted to Grassland	CO <sub>2</sub>	(16.3)		,	
CO <sub>2</sub> Emissions from Grassland Remaining Grassland	$CO_2$	16.1	✓	Т	
CO <sub>2</sub> Emissions from Landfilled Yard Trimmings and Food Scraps	$CO_2$	(8.8)	✓	Т	
CO <sub>2</sub> Emissions from Land Converted to Cropland	$CO_2$	7.2			
CH <sub>4</sub> Emissions from Forest Land Remaining Forest Land	CH <sub>4</sub>	11.6			
N <sub>2</sub> O Emissions from Settlements Remaining Settlements	$N_2O$	5.8			
N <sub>2</sub> O Emissions from Forest Land Remaining Forest Land	N <sub>2</sub> O	1.5			

a Emissions from these sources not included in totals.

Note: The Tier 1 approach for identifying key categories does not directly include assessment of uncertainty in emission estimates.

## **Evaluation of Tier 1 Key Categories**

#### **Level Assessment**

When using a Tier 1 approach for the level assessment, a predetermined cumulative emissions threshold is used to identify key categories. When source and sink categories are sorted in order of decreasing absolute emissions, those that fall at the top of the list and cumulatively account for 95 percent of emissions are considered key categories. The 95 percent threshold in the IPCC *Good Practice Guidance* (IPCC 2000) was designed to establish a general level where the key category analysis covers approximately 75 to 92 percent of inventory uncertainty.

It is important to note that a key category analysis can be sensitive to the definitions of the source and sink categories. If a large source category is split into many subcategories, then the subcategories may have contributions to the total inventory that are too small for those source categories to be considered key. Similarly, a collection of small, non-key source categories adding up to less than 5 percent of total emissions could become key source categories if those source categories were aggregated into a single source category. The United States has attempted to define source and sink categories by the conventions which would allow comparison with other international key categories, while still maintaining the category definitions that constitute how the emissions estimates were calculated for this report. As such, some of the category names used in the key category analysis may differ from the names used in the main body of the report. Additionally, the United States accounts for some source categories, including fossil fuel feedstocks, international bunkers, and emissions from U.S. territories, that are derived from unique data sources using country-specific methodologies.

### **Trend Assessment**

The United States is currently taking a Tier 1 approach to identify trend assessment key categories until a full and consistent inventory-wide uncertainty analysis is completed. The Tier 1 approach for trend assessment is defined as the product of the source or sink category level assessment and the absolute difference between the source or sink category trend and the total trend. In turn, the source or sink category trend is defined as the change in emissions from the base year to the current year, as a percentage of current year emissions from that source or sink category. The total trend is the percentage change in total inventory emissions from the base year to the current year.

<sup>+</sup> Does not exceed 0.05 Ta CO<sub>2</sub> Ea.

Thus, the source or sink category trend assessment will be large if the source or sink category represents a large percentage of emissions and/or has a trend that is quite different from the overall inventory trend. To determine key categories, the trend assessments are sorted in decreasing order, so that the source or sink categories with the highest trend assessments appear first. The trend assessments are summed until the threshold of 95 percent is reached; all categories that fall within that cumulative 95 percent are considered key categories.

## **Tier 2 Key Category Assessment**

IPCC Good Practice Guidance (IPCC 2000) recommends using a Tier 2 method for identifying key source categories if nationally derived source-level uncertainties are measured. The Tier 2 approach is a more detailed analysis that builds on the Tier 1 approach by multiplying the results of the Tier 1 analysis by the relative uncertainty of each source category. This method is likely to reduce the number of key source categories under consideration. As part of its multi-year uncertainty assessment effort, the United States has already developed quantitative uncertainty estimates for most source and sink categories. When quantitative estimates of uncertainty become available for all source categories, future inventories can incorporate this Tier 2 approach.

Table A- 4: 1990 Key Source Category Tier 1 Analysis—Level Assessment, without LULUCF

Table 4-4. 1770 key source category free Tahlarysis	LOVOINSS	essinent, with	out LOLOGI		Cumulative
		1990 Estimate	1990 Estimate	Level	Total of Level
IPCC Source Categories	Direct GHG	(Tg CO <sub>2</sub> Eq.)		Assessment	
CO <sub>2</sub> Emissions from Stationary Combustion - Coal	CO <sub>2</sub>	1699.0	1699.0	0.27	0.27
Mobile Combustion: Road & Other	CO <sub>2</sub>	1237.2	1237.2	0.20	0.47
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	CO <sub>2</sub>	975.4	975.4	0.16	0.63
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	CO <sub>2</sub>	585.4	585.4	0.09	0.72
Direct N <sub>2</sub> O Emissions from Agricultural Soil Management	N <sub>2</sub> O	310.1	310.1	0.05	0.77
Mobile Combustion: Aviation	CO <sub>2</sub>	180.0	180.0	0.03	0.80
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	161.0	161.0	0.03	0.83
Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	124.5	124.5	0.02	0.85
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	CO <sub>2</sub>	117.3	117.3	0.02	0.87
CH <sub>4</sub> Emissions from Enteric Fermentation	CH <sub>4</sub>	115.7	115.7	0.02	0.88
CO <sub>2</sub> Emissions from Iron and Steel Production	CO <sub>2</sub>	84.9	84.9	0.01	0.90
Fugitive Emissions from Coal Mining	CH <sub>4</sub>	81.9	81.9	0.01	0.91
Indirect N <sub>2</sub> O Emissions from Applied Nitrogen	N <sub>2</sub> O	56.8	56.8	0.01	0.92
Mobile Combustion: Marine	CO <sub>2</sub>	46.8	46.8	0.01	0.93
Mobile Combustion: Road & Other	N <sub>2</sub> O	41.6	41.6	0.01	0.93
HFC-23 Emissions from HCFC-22 Production	HFCs	35.0	35.0	0.01	0.94
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	34.4	34.4	0.01	0.95
CO <sub>2</sub> Emissions from Natural Gas Systems	CO <sub>2</sub>	33.7	33.7	0.01	0.95
CO <sub>2</sub> Emissions from Cement Manufacture	$CO_2$	33.3	33.3	0.01	0.96
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>	30.9	30.9	<0.01	0.96
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	SF <sub>6</sub>	27.1	27.1	<0.01	0.97
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	24.8	24.8	<0.01	0.97
CO <sub>2</sub> Emissions from Ammonia Production and Urea Application	$CO_2$	19.3	19.3	<0.01	0.97
PFC Emissions from Aluminum Production	PFCs	18.5	18.5		0.98
N <sub>2</sub> O Emissions from Nitric Acid Production	$N_2O$	17.8	17.8	<0.01	0.98
N <sub>2</sub> O Emissions from Adipic Acid Production	$N_2O$	15.2	15.2	<0.01	0.98
Non-CO <sub>2</sub> Emissions from Stationary Combustion	$N_2O$	12.3	12.3		0.98
CO <sub>2</sub> Emissions from Lime Manufacture	$CO_2$	11.3	11.3		0.98
CO <sub>2</sub> Emissions from Waste Combustion	$CO_2$	10.9	10.9	<0.01	0.99
N <sub>2</sub> O Emissions from Manure Management	$N_2O$	8.6	8.6	<0.01	0.99
Non-CO <sub>2</sub> Emissions from Stationary Combustion	CH <sub>4</sub>	8.0	8.0	<0.01	0.99
CH <sub>4</sub> Emissions from Rice Cultivation	CH₄	7.1	7.1	<0.01	0.99
CO <sub>2</sub> Emissions from Aluminum Production	$CO_2$	6.8	6.8	<0.01	0.99
N <sub>2</sub> O Emissions from Wastewater	$N_2O$	6.4	6.4	<0.01	0.99
Fugitive Emissions from Abandoned Coal Mines	CH <sub>4</sub>	6.0	6.0	<0.01	0.99
CO <sub>2</sub> Emissions from Limestone and Dolomite Use	$CO_2$	5.5	5.5	<0.01	0.99
SF <sub>6</sub> Emissions from Magnesium Production and Processing	SF <sub>6</sub>	5.4	5.4	<0.01	0.99
Mobile Combustion: Road & Other	CH₄	4.5	4.5	<0.01	1.00
N <sub>2</sub> O Emissions from N <sub>2</sub> O Product Usage	N <sub>2</sub> O	4.3	4.3	<0.01	1.00
CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption	CO <sub>2</sub>	4.1	4.1	<0.01	1.00

TOTAL		6229.0	6229.0	1.00	
CH <sub>4</sub> Emissions from Ferroalloy Production	CH <sub>4</sub>	+	+	<0.01	1.00
Consumption	0.1			0.04	
CH <sub>4</sub> Emissions from Silicon Carbide Production and	CH <sub>4</sub>	+	+	<0.01	1.00
Mobile Combustion: Marine	CH <sub>4</sub>	0.1	0.1	<0.01	1.00
Mobile Combustion: Aviation	CH <sub>4</sub>	0.2	0.2	<0.01	1.00
CO <sub>2</sub> Emissions from Lead Production	$CO_2$	0.3	0.3	<0.01	1.00
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	0.3	<0.01	1.00
N <sub>2</sub> O Emissions from Field Burning of Agricultural Residues	$N_2O$	0.4	0.4	<0.01	1.00
Consumption					
CO <sub>2</sub> Emissions from Silicon Carbide Production and	$CO_2$	0.4	0.4	<0.01	1.00
Mobile Combustion: Marine	$N_2O$	0.4	0.4	<0.01	1.00
Energy					
CO <sub>2</sub> Emissions from Stationary Combustion - Geothermal	CO <sub>2</sub>	0.4	0.4	<0.01	1.00
N <sub>2</sub> O Emissions from Waste Combustion	N <sub>2</sub> O	0.5	0.5	<0.01	1.00
CH <sub>4</sub> Emissions from Field Burning of Agricultural Residues	CH <sub>4</sub>	0.7	0.7	<0.01	1.00
CH <sub>4</sub> Emissions from Petrochemical Production	CH <sub>4</sub>	0.9	0.9	<0.01	1.00
CO <sub>2</sub> Emissions from Zinc Production	CO <sub>2</sub>	0.9	0.9	<0.01	1.00
CO <sub>2</sub> Emissions from Titanium Dioxide Production	CO <sub>2</sub>	1.3	1.3	<0.01	1.00
CH <sub>4</sub> Emissions from Iron and Steel Production	CH <sub>4</sub>	1.3	1.3	<0.01	1.00
CO <sub>2</sub> Emissions from Carbon Dioxide Consumption	CO <sub>2</sub>	1.4	1.4	<0.01	1.00
CO <sub>2</sub> Emissions from Phosphoric Acid Production	CO <sub>2</sub>	1.5	1.5	<0.01	1.00
Mobile Combustion: Aviation	N <sub>2</sub> O	1.7	1.7	<0.01	1.00
CO <sub>2</sub> Emissions from Ferroalloy Production	CO <sub>2</sub>	2.2	2.2	<0.01	1.00
CO <sub>2</sub> Emissions from Petrochemical Production	CO <sub>2</sub>	2.2	2.2	<0.01	1.00
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor Manufacture	SF <sub>6</sub>	2.9	2.9	<0.01	1.00

Note: LULUCF sources and sinks are not included in this analysis.

Table A- 5: 1990 Key Source Category Tier 1 Analysis—Level Assessment, with LULUCF

Table A-3. 1770 key Jource Category Her Fallarysis					Cumulative
		1990 Estimate			Total of Level
IPCC Source Categories	Direct GHG	(Tg CO₂ Eq.)	(Tg CO <sub>2</sub> Eq.)	Assessment	Assessment
CO <sub>2</sub> Emissions from Stationary Combustion - Coal	CO <sub>2</sub>	1699.0	1699.0	0.24	0.24
Mobile Combustion: Road & Other	CO <sub>2</sub>	1237.2	1237.2	0.18	0.42
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	CO <sub>2</sub>	975.4	975.4	0.14	0.56
CO <sub>2</sub> Emissions from Forest Land Remaining Forest Land	CO <sub>2</sub>	598.5	598.5	0.09	0.65
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	$CO_2$	585.4	585.4	80.0	0.73
Direct N <sub>2</sub> O Emissions from Agricultural Soil Management	N <sub>2</sub> O	310.1	310.1	0.04	0.78
Mobile Combustion: Aviation	CO <sub>2</sub>	180.0	180.0	0.03	0.80
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	161.0	161.0	0.02	0.82
Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	124.5	124.5	0.02	0.84
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	CO <sub>2</sub>	117.3	117.3	0.02	0.86
CH <sub>4</sub> Emissions from Enteric Fermentation	CH <sub>4</sub>	115.7	115.7	0.02	0.88
CO <sub>2</sub> Emissions from Iron and Steel Production	CO <sub>2</sub>	84.9	84.9	0.01	0.89
Fugitive Emissions from Coal Mining	CH <sub>4</sub>	81.9	81.9	0.01	0.90
CO <sub>2</sub> Emissions from Settlements Remaining Settlements	CO <sub>2</sub>	57.5	57.5	0.01	0.91
Indirect N <sub>2</sub> O Emissions from Applied Nitrogen	N <sub>2</sub> O	56.8	56.8	0.01	0.92
Mobile Combustion: Marine	CO <sub>2</sub>	46.8	46.8	0.01	0.92
Mobile Combustion: Road & Other	N <sub>2</sub> O	41.6	41.6	0.01	0.93
HFC-23 Emissions from HCFC-22 Production	HFCs	35.0	35.0	0.01	0.93
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	34.4	34.4	<0.01	0.94
CO <sub>2</sub> Emissions from Natural Gas Systems	CO <sub>2</sub>	33.7	33.7	<0.01	0.94
CO <sub>2</sub> Emissions from Cement Manufacture	CO <sub>2</sub>	33.3	33.3	<0.01	0.95
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>	30.9	30.9	<0.01	0.95
CO <sub>2</sub> Emissions from Cropland Remaining Cropland	$CO_2$	28.1	28.1	<0.01	0.96
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	SF <sub>6</sub>	27.1	27.1	< 0.01	0.96
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	24.8	24.8	< 0.01	0.96
CO2 Emissions from Landfilled Yard Trimmings and Food Scraps	$CO_2$	22.8	22.8	<0.01	0.97
CO <sub>2</sub> Emissions from Ammonia Production and Urea Application	CO <sub>2</sub>	19.3	19.3	<0.01	0.97
PFC Emissions from Aluminum Production	PFCs	18.5	18.5	<0.01	0.97
N <sub>2</sub> O Emissions from Nitric Acid Production	N <sub>2</sub> O	17.8	17.8	<0.01	0.98

N <sub>2</sub> O Emissions from Adipic Acid Production	N <sub>2</sub> O	15.2	15.2	<0.01	0.98
CO <sub>2</sub> Emissions from Land Converted to Grassland	CO <sub>2</sub>	14.6	14.6	<0.01	0.98
Non-CO <sub>2</sub> Emissions from Stationary Combustion	N <sub>2</sub> O	12.3	12.3	<0.01	0.98
CO <sub>2</sub> Emissions from Lime Manufacture	CO <sub>2</sub>	11.3	11.3	<0.01	0.98
CO <sub>2</sub> Emissions from Waste Combustion	CO <sub>2</sub>	10.9	10.9	<0.01	0.98
CO <sub>2</sub> Emissions from Land Converted to Cropland	CO <sub>2</sub>	8.7	8.7	<0.01	0.99
N <sub>2</sub> O Emissions from Manure Management	N <sub>2</sub> O	8.6	8.6	<0.01	0.99
Non-CO <sub>2</sub> Emissions from Stationary Combustion	CH <sub>4</sub>	8.0	8.0	<0.01	0.99
CH <sub>4</sub> Emissions from Rice Cultivation	CH <sub>4</sub>	7.1	7.1	<0.01	0.99
CH <sub>4</sub> Emissions from Forest Land Remaining Forest Land	CH <sub>4</sub>	7.1	7.1	<0.01	0.99
CO <sub>2</sub> Emissions from Aluminum Production	$CO_2$	6.8	6.8	<0.01	0.99
N <sub>2</sub> O Emissions from Wastewater	$N_2O$	6.4	6.4	<0.01	0.99
Fugitive Emissions from Abandoned Coal Mines	CH <sub>4</sub>	6.0	6.0	<0.01	0.99
CO <sub>2</sub> Emissions from Limestone and Dolomite Use	$CO_2$	5.5	5.5	<0.01	0.99
SF <sub>6</sub> Emissions from Magnesium Production and Processing	$SF_6$	5.4	5.4	<0.01	0.99
N <sub>2</sub> O Emissions from Settlements Remaining Settlements	$N_2O$	5.1	5.1	<0.01	1.00
Mobile Combustion: Road & Other	CH <sub>4</sub>	4.5	4.5	< 0.01	1.00
N <sub>2</sub> O Emissions from N <sub>2</sub> O Product Usage	$N_2O$	4.3	4.3	< 0.01	1.00
CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption	CO <sub>2</sub>	4.1	4.1	<0.01	1.00
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor Manufacture	SF <sub>6</sub>	2.9	2.9	<0.01	1.00
CO <sub>2</sub> Emissions from Petrochemical Production	CO <sub>2</sub>	2.2	2.2	<0.01	1.00
CO <sub>2</sub> Emissions from Ferroalloy Production	CO <sub>2</sub>	2.2	2.2	<0.01	1.00
Mobile Combustion: Aviation	N <sub>2</sub> O	1.7	1.7	<0.01	1.00
CO <sub>2</sub> Emissions from Phosphoric Acid Production	CO <sub>2</sub>	1.5	1.7	<0.01	1.00
CO <sub>2</sub> Emissions from Carbon Dioxide Consumption	CO <sub>2</sub>	1.5	1.5	<0.01	1.00
	CO <sub>2</sub> CH <sub>4</sub>	1.4	1.4	<0.01	1.00
CH <sub>4</sub> Emissions from Iron and Steel Production					
CO <sub>2</sub> Emissions from Titanium Dioxide Production	CO <sub>2</sub>	1.3	1.3	<0.01	1.00
CO <sub>2</sub> Emissions from Zinc Production	CO <sub>2</sub>	0.9	0.9	<0.01	1.00
CH <sub>4</sub> Emissions from Petrochemical Production	CH <sub>4</sub>	0.9	0.9	<0.01	1.00
N <sub>2</sub> O Emissions from Forest Land Remaining Forest Land	$N_2O$	0.8	0.8	<0.01	1.00
CH <sub>4</sub> Emissions from Field Burning of Agricultural Residues	CH <sub>4</sub>	0.7	0.7	<0.01	1.00
N <sub>2</sub> O Emissions from Waste Combustion	$N_2O$	0.5	0.5	<0.01	1.00
CO <sub>2</sub> Emissions from Stationary Combustion - Geothermal	$CO_2$	0.4	0.4	<0.01	1.00
Energy					
Mobile Combustion: Marine	$N_2O$	0.4	0.4	<0.01	1.00
CO <sub>2</sub> Emissions from Silicon Carbide Production and	$CO_2$	0.4	0.4	<0.01	1.00
Consumption					
N <sub>2</sub> O Emissions from Field Burning of Agricultural Residues	$N_2O$	0.4	0.4	<0.01	1.00
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	0.3	< 0.01	1.00
CO <sub>2</sub> Emissions from Lead Production	$CO_2$	0.3	0.3	< 0.01	1.00
Mobile Combustion: Aviation	CH <sub>4</sub>	0.2	0.2	<0.01	1.00
CO <sub>2</sub> Emissions from Grassland Remaining Grassland	CO <sub>2</sub>	0.1	0.1	<0.01	1.00
Mobile Combustion: Marine	CH <sub>4</sub>	0.1	0.1	<0.01	1.00
CH <sub>4</sub> Emissions from Silicon Carbide Production and	CH <sub>4</sub>	+	+	<0.01	1.00
Consumption	O1 14	т	т	~0.01	1.00
·	CH <sub>4</sub>			<0.01	1.00
CH4 Emissions from Ferroalloy Production	UП4	+	+ 	<0.01	1.00
TOTAL		6972.4	6972.4	1.00	

Table A- 6: 2005 Key Source Category Tier 1 Analysis—Level Assessment, without LULUCF

					Cumulative
		1990 Estimate	2005 Estimate	Level	Total of Level
IPCC Source Categories	Direct GHG	(Tg CO₂ Eq.)	(Tg CO <sub>2</sub> Eq.)	Assessment	Assessment
CO <sub>2</sub> Emissions from Stationary Combustion - Coal	CO <sub>2</sub>	1699.0	2093.6	0.29	0.29
Mobile Combustion: Road & Other	CO <sub>2</sub>	1237.2	1642.9	0.23	0.52
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	CO <sub>2</sub>	975.4	1138.2	0.16	0.67
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	CO <sub>2</sub>	585.4	626.3	0.09	0.76
Direct N <sub>2</sub> O Emissions from Agricultural Soil Management	N <sub>2</sub> O	310.1	310.5	0.04	0.80
Mobile Combustion: Aviation	CO <sub>2</sub>	180.0	186.1	0.03	0.83
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	CO <sub>2</sub>	117.3	142.4	0.02	0.85
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	161.0	132.0	0.02	0.87
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	123.3	0.02	0.88

CH4	01.5	011	445.7	110.1	0.00	0.00
Mobile Combustion: Marine indirect Nyo Emissions from Applied Nitrogen         No.0         56.8         54.6         0.01         0.98           Fugitive Emissions from Coal Mining         CH         81.9         52.4         0.01         0.94           Co.2         Emissions from Cenent Manufacture         CO.0         33.3         45.5         0.01         0.94           GO.2         Emissions from Cenent Manufacture         CO.0         33.3         45.5         0.01         0.98           Co.2         Emissions from Form Cener As Olher         N.O         41.6         35.7         <0.01         0.98           Mobile Combustion: Road & Olher         N.O         41.6         35.7         <0.01         0.98           Co.2         Emissions from Patroleum Systems         CO.1         41.6         35.7         <0.01         0.98           Co.2         Emissions from Natural Gas Systems         CO.2         33.7         28.2         <0.01         0.98           Co.2         Emissions from Waste Combustion         CO.2         33.7         28.2         <0.01         0.98           Co.2         Emissions from Manual Production and Urea Application         FIC.3         35.0         16.5         <0.01         9.98           Co.2	CH <sub>4</sub> Emissions from Enteric Fermentation	CH <sub>4</sub>	115.7	112.1	0.02	0.90
Indirect No Emissions from Applied Nitrogen   No   56.8   54.6   0.01   0.38						
Fugitive Emissions from Coal Mining						
GOZ         Emissions from Cement Manufacture         CO2         33.3         45.5         0.01         0.95           CD2         Emissions from In and Steel Production         CO2         84.9         45.2         0.01         0.95           CH4         Emissions from Manure Management         CH4         30.9         41.2         0.01         0.96           CH2         Emissions from Nature Management         CH4         34.4         28.5         <0.01						
COL Bussions from Inton and Steel Production						
CH4 Emissions from Manure Management CH4 30.9 41.2 0.01 0.96 Mobile Combustion Road & Other No.0 11.6 35.7 < 0.01 0.96 Fugitive Emissions from Petroleum Systems CH4 34.4 28.5 < 0.01 0.96 Fugitive Emissions from Natural Gas Systems CO₂ 33.7 28.2 < 0.01 0.97 CH4 Emissions from Matural Gas Systems CO₂ 33.7 28.2 < 0.01 0.97 CH4 Emissions from Matural Gas Systems CO₂ 10.9 32.5 < 0.01 0.97 CH2 Emissions from Wastewater Treatment CH4 24.8 25.4 < 0.01 0.97 CH2 Emissions from Wastewater Treatment CH4 24.8 25.4 < 0.01 0.97 CH2 Emissions from Wastewater Treatment CH4 24.8 25.4 < 0.01 0.97 CH2 Emissions from Wastewater Treatment CH2 24.8 35.0 16.5 < 0.01 0.98 CH2 Emissions from Matural CH2 Emissions from Electrical Transmission and Distribution SFa 27.1 13.2 < 0.01 0.98 Nor-CO₂ Emissions from Matural Management No CO₂ 11.3 13.7 < 0.01 0.99 No₂ Emissions from Matural Management No CO₂ Emissions from Wastewater CH2 Emissions from Wastewater No CO₂ Emissions from Wastewater No CO₂ Emissions from Wastewater CH2 Emissions from Wastewat						
Mobile Combustion: Road & Other 'Figility Emissions from Petroleum Systems         No. CH         41.6         35.7         <0.01         0.96           CO2 Emissions from Natural Gas Systems         CO2         33.7         28.2         <0.01						
Fugitive Emissions from Petroleum Systems						
CO_Emissions from Watural Gas Systems         CO2         33.7         28.2         <0.01         0.97           CH_Emissions from Waste Combustion         CO2         10.9         20.9         <0.01						
CH4 Emissions from Wastewater Treatment CP1, Emissions from Waste Combustion CO2, Emissions from Waste Combustion CO3, Emissions from Waste Combustion CO4, Emissions from Marker Combustion CO5, Emissions from Marker Combustion CO5, Emissions from Minimark Combustion N20 CD5, Emissions from Minimark Combustion N20 CD6, Emissions from Stationary Combustion N20 CD6, Emissions from Stationary Combustion N20 CD7, Emissions from Emission and Distribution N20 CD7, Emissions from Emission and Distribution N20 CD7, Emissions from Emission and Distribution SF6 CD7, Emissions from Marker Management N20 CD8, Emissions from Marker Management N20 CD8, Emissions from Marker Management N20 CD9, Emissions from Manader Code Minimarker N20 CD9, Emissions from Manader Code Minimarker N20 CD9, Emissions from Management Production CD9, Emissions from Emission	Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	34.4		<0.01	
CO2 Emissions from Waste Combustion         CO2 Himssions from HCP-C2P roduction         CO2 Himssions from Ammonia Production and Urea Application         CO2 Himssions from Ammonia Production and Urea Application         CO2 Himssions from Nitrio Acid Production         N2O Himssions from Nitrio Acid Production         N2O Himssions from Nitrio Acid Production         N2O HIMSSION STATE ACID ACID ACID ACID ACID ACID ACID ACID	CO <sub>2</sub> Emissions from Natural Gas Systems				<0.01	0.97
HFC-22 Emissions from HCFC-22 Production CO₂ Emissions from Ammonia Production and Urea Application CO₂ Emissions from Nitrio Acid Production N≥O 17.8 15.7 0.01 0.98 N₀ Cemissions from Nitrio Acid Production N≥O 17.8 15.7 0.01 0.98 N₀ Co₂ Emissions from Stationary Combustion N≥O 12.3 13.8 0.01 0.98 N₀ Co₂ Emissions from Stationary Combustion N≥O 12.3 13.8 0.01 0.98 SFa Emissions from Stationary Combustion SFa Co₂ Emissions from Lime Manufacture Co₂ 11.3 13.7 0.01 0.99 SFa Emissions from Electrical Transmission and Distribution SFa Demissions from Manure Management N≥O 0.86 0.95 N₂O Emissions from Manure Management N≥O 0.64 0.64 0.01 0.99 N₂O Emissions from Manure Management N≥O 0.64 0.64 0.01 0.99 N₂O Emissions from Manure Management N≥O 0.64 0.64 0.01 0.99 N₂O Emissions from Stationary Combustion CHa 0.60 0.61 0.69 0.61 0.61 0.69 0.61 0.61 0.61 0.61 0.61 0.61 0.61 0.61	CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>			<0.01	
CO2 Emissions from Nitrio Acid Production         CO2 (2)         19.3         16.3         <0.01         0.98           N2O Emissions from Nitrio Acid Production         N2O         17.8         15.7         <0.01	CO <sub>2</sub> Emissions from Waste Combustion	$CO_2$	10.9	20.9	< 0.01	0.97
No Demissions from Nitric Acid Production	HFC-23 Emissions from HCFC-22 Production	HFCs	35.0	16.5	< 0.01	0.98
No Demissions from Nitric Acid Production	CO <sub>2</sub> Emissions from Ammonia Production and Urea Application	$CO_2$	19.3	16.3	< 0.01	0.98
Non-CO₂ Emissions from Lied Manufacture		$N_2O$		15.7	< 0.01	
CO₂ Emissions from Lieutria Ima Manufacture         CO₂         11.3         13.7         < 0.01         0.99           SF₂ Emissions from Electrical Transmission and Distribution         SF₃         27.1         13.2         <0.01						
SFE Emissions from Electrical Transmission and Distribution         SF <sub>E</sub> 27.1         13.2         <0.01         0.99           N/O Emissions from Manure Management         N≥O         6.4         8.0         <0.01						
N2O Emissions from Manure Management   N2O   8.6   9.5   < < 0.01   0.99     N2O Emissions from Wastewater   N2O   6.4   8.0   < < 0.01   0.99     N2O Emissions from Limestone and Dolomite Use   CO₂   5.5   7.4   < < 0.01   0.99     N3F						
No						
CO₂ Emissions from Limestone and Dolomite Use         CO₂ Emissions from Stationary Combustion         CH4         8.0         6.9         <0.01         0.99           Non-CO₂ Emissions from Rize Cultivation         CH4         7.1         6.9         <0.01	<u> </u>					
Non-CO₂ Emissions from Rice Cutivation						
CH₄ Emissions from Rice Cultivation         CH₄         7.1         6.9         <0.01         0.99           N₂O Emissions from Adipic Acid Production         N₂O         15.2         6.0         <0.01						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
Fugitive Emissions from Abandoned Coal Mines         CH <sub>4</sub> 6.0         5.5         <0.01         0.99           PFC, HFC, and SF <sub>E</sub> Emissions from Semiconductor         SF <sub>E</sub> 2.9         4.3         <0.01						
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor Manufacture         SF <sub>6</sub> 2.9         4.3         <0.01         0.99 Manufacture           N₂O Emissions from N₂O Product Usage         N₂O         4.3         4.3         <0.01						
Manufacture         N₂O Emissions from N₂O Product Usage         N₂O Cog. Emissions from Soda Ash Manufacture and Consumption         CO₂ Emissions from Soda Ash Manufacture and Consumption         CO₂ Emissions from Soda Ash Manufacture and Consumption         CO₂ deliable and Soda Ash Consumption         CO₂ deliable and Soda Ash Consumption         CO₂ deliable and Consumption         CO₂ deliable and Consumption         CO₂ deliable and Consu						
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		SF <sub>6</sub>	2.9	4.3	<0.01	0.99
CO₂ Emissions from Soda Ash Manufacture and Consumption         CO₂         4.1         4.2         <0.01         1.00           CO₂ Emissions from Aluminum Production         CO₂         6.8         4.2         <0.01						
CO₂ Emissions from Aluminum Production         CO₂         6.8         4.2         <0.01         1.00           PFC Emissions from Aluminum Production         PFCs         18.5         3.0         <0.01						
PFC Emissions from Aluminum Production         PFCs         18.5         3.0         <0.01         1.00           CO₂ Emissions from Petrochemical Production         CO₂         2.2         2.9         <0.01	CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption					
CO₂ Emissions from Petrochemical Production         CO₂         2.2         2.9         <0.01         1.00           SF₀ Emissions from Magnesium Production and Processing         SF₀         5.4         2.7         <0.01	CO <sub>2</sub> Emissions from Aluminum Production	$CO_2$	6.8	4.2	<0.01	1.00
SF6 Emissions from Magnesium Production and Processing Mobile Combustion: Road & Other CH4	PFC Emissions from Aluminum Production	PFCs		3.0	<0.01	1.00
Mobile Combustion: Road & Other         CH4         4.5         2.4         <0.01         1.00           CO₂ Emissions from Titanium Dioxide Production         CO₂         1.3         1.9         <0.01	CO <sub>2</sub> Emissions from Petrochemical Production	$CO_2$	2.2	2.9	<0.01	1.00
Mobile Combustion: Road & Other         CH <sub>4</sub> 4.5         2.4         <0.01         1.00           CO₂ Emissions from Titanium Dioxide Production         CO₂         1.3         1.9         <0.01	SF <sub>6</sub> Emissions from Magnesium Production and Processing	SF <sub>6</sub>	5.4	2.7	< 0.01	1.00
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		CH₄	4.5	2.4	< 0.01	1.00
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			1.3		< 0.01	
CO2 Emissions from Ferroalloy Production         CO2 CO2         2.2         1.4         <0.01         1.00           CO2 Emissions from Phosphoric Acid Production         CO2 CO2         1.5         1.4         <0.01						
CO2 Emissions from Phosphoric Acid Production         CO2         1.5         1.4         <0.01         1.00           CO2 Emissions from Carbon Dioxide Consumption         CO2         1.4         1.3         <0.01						
CO2 Emissions from Carbon Dioxide Consumption         CO2         1.4         1.3         <0.01						
CH4 Emissions from Petrochemical Production       CH4       0.9       1.1       <0.01						
CH4 Emissions from Iron and Steel Production       CH4       1.3       1.0       <0.01						
CH4 Emissions from Field Burning of Agricultural Residues       CH4       0.7       0.9       <0.01						
N2O Emissions from Field Burning of Agricultural Residues         N2O         0.4         0.5         <0.01         1.00           Mobile Combustion: Marine         N2O         0.4         0.5         <0.01						
Mobile Combustion: Marine         N2O         0.4         0.5         <0.01         1.00           CO2 Emissions from Zinc Production         CO2         0.9         0.5         <0.01						
$ \begin{array}{c} \text{CO}_2 \text{ Emissions from Zinc Production} & \text{CO}_2 & 0.9 & 0.5 & <0.01 & 1.00 \\ \text{N}_2\text{O Emissions from Waste Combustion} & \text{N}_2\text{O} & 0.5 & 0.4 & <0.01 & 1.00 \\ \text{CO}_2 \text{ Emissions from Stationary Combustion - Geothermal} & \text{CO}_2 & 0.4 & 0.4 & <0.01 & 1.00 \\ \text{Energy} & & & & & & & & & & & & \\ \text{CO}_2 \text{ Emissions from Lead Production} & \text{CO}_2 & 0.3 & 0.3 & <0.01 & 1.00 \\ \text{CO}_2 \text{ Emissions from Silicon Carbide Production and} & \text{CO}_2 & 0.4 & 0.2 & <0.01 & 1.00 \\ \text{Consumption} & & & & & & & & \\ \text{Mobile Combustion: Aviation} & \text{CH}_4 & 0.2 & 0.1 & <0.01 & 1.00 \\ \text{Mobile Combustion: Marine} & \text{CH}_4 & 0.1 & 0.1 & <0.01 & 1.00 \\ \text{CH}_4 \text{ Emissions from Silicon Carbide Production and} & \text{CH}_4 & + & + & <0.01 & 1.00 \\ \text{Consumption} & & & & & & & \\ \text{CH}_4 \text{ Emissions from Ferroalloy Production} & \text{CH}_4 & + & + & <0.01 & 1.00 \\ \end{array}$						
N2O Emissions from Waste Combustion       N2O       0.5       0.4       <0.01       1.00         CO2 Emissions from Stationary Combustion - Geothermal Energy       CO2       0.4       0.4       <0.01						
CO2 Emissions from Stationary Combustion - Geothermal Energy       CO2       0.4       0.4       <0.01       1.00         CO2 Emissions from Lead Production       CO2       0.3       0.3       <0.01						
Energy         CO2 Emissions from Lead Production         CO2 O2 Emissions from Lead Production and CO2 Emissions from Silicon Carbide Production and CO3 Emissions from Silicon Carbide Production and CO3 Emissions from Silicon Carbide Production and CO3 Emission: Aviation         CO2 O.4 O.2 O.1 Emission: Aviation Incomplete CO3	=					
CO2 Emissions from Lead Production         CO2         0.3         0.3         <0.01         1.00           CO2 Emissions from Silicon Carbide Production and Consumption         CO2         0.4         0.2         <0.01	•	$CO_2$	0.4	0.4	<0.01	1.00
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
Consumption           Mobile Combustion: Aviation         CH4         0.2         0.1         <0.01         1.00           Mobile Combustion: Marine         CH4         0.1         0.1         <0.01						
Mobile Combustion: Aviation         CH4         0.2         0.1         <0.01         1.00           Mobile Combustion: Marine         CH4         0.1         0.1         <0.01		$CO_2$	0.4	0.2	<0.01	1.00
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
CH <sub>4</sub> Emissions from Silicon Carbide Production and CH <sub>4</sub> + + <0.01 1.00 Consumption  CH <sub>4</sub> Emissions from Ferroalloy Production CH <sub>4</sub> + + <0.01 1.00	Mobile Combustion: Aviation		0.2			1.00
Consumption CH <sub>4</sub> Emissions from Ferroalloy Production CH <sub>4</sub> + + <0.01 1.00	Mobile Combustion: Marine		0.1	0.1	<0.01	1.00
CH <sub>4</sub> Emissions from Ferroalloy Production CH <sub>4</sub> + + <0.01 1.00	CH <sub>4</sub> Emissions from Silicon Carbide Production and	CH <sub>4</sub>	+	+	<0.01	1.00
CH <sub>4</sub> Emissions from Ferroalloy Production CH <sub>4</sub> + + <0.01 1.00	Consumption					
		CH <sub>4</sub>	+	+	< 0.01	1.00
			6229.0	7241.5	1.00	

TOTAL

Note: LULUCF sources and sinks are not included in this analysis.

Table A-7: 2005 Key Source Category Tier 1 Analysis—Level Assessment with LULUCF

	IPCC Source Categories	Direct GHG 1990 Estimate	2005 Estimate	Level Cumulative
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		(Tg CO <sub>2</sub> Eq.)	(Tg CO <sub>2</sub> Eq.)	Assessment	Total of Level
					Assessment
CO <sub>2</sub> Emissions from Stationary Combustion - Coal	CO <sub>2</sub>	1699.0	2093.6	0.26	0.26
Mobile Combustion: Road & Other	CO <sub>2</sub>	1237.2	1642.9	0.20	0.46
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	CO <sub>2</sub>	975.4	1138.2	0.14	0.60
CO <sub>2</sub> Emissions from Forest Land Remaining Forest Land	CO <sub>2</sub>	598.5	698.7	0.09	0.69
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	CO <sub>2</sub>	585.4	626.3	80.0	0.76
Direct N <sub>2</sub> O Emissions from Agricultural Soil Management	N <sub>2</sub> O	310.1	310.5	0.04	0.80
Mobile Combustion: Aviation	CO <sub>2</sub>	180.0	186.1	0.02	
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	CO <sub>2</sub>	117.3	142.4	0.02	0.84
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	161.0	132.0	0.02	0.86
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	123.3	0.02	
CH <sub>4</sub> Emissions from Enteric Fermentation	CH <sub>4</sub>	115.7	112.1	0.01	0.89
Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	124.5	111.1	0.01	0.90
CO <sub>2</sub> Emissions from Settlements Remaining Settlements	CO <sub>2</sub>	57.5	88.5	0.01	0.91
Mobile Combustion: Marine	$CO_2$	46.8	63.7	0.01	0.92
Indirect N <sub>2</sub> O Emissions from Applied Nitrogen	N <sub>2</sub> O	56.8	54.6	0.01	0.92
Fugitive Emissions from Coal Mining	CH₄	81.9	52.4	0.01	0.93
CO <sub>2</sub> Emissions from Cement Manufacture	CO <sub>2</sub>	33.3	45.9	0.01	0.94
CO <sub>2</sub> Emissions from Iron and Steel Production	CO <sub>2</sub>	84.9	45.2	0.01	0.94
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>	30.9	41.3	0.01	0.95
CO <sub>2</sub> Emissions from Cropland Remaining Cropland	CO <sub>2</sub>	28.1	39.4	<0.01	0.95
Mobile Combustion: Road & Other	N <sub>2</sub> O	41.6	35.7	<0.01	0.96
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	34.4	28.5	<0.01	0.96
CO <sub>2</sub> Emissions from Natural Gas Systems	$CO_2$	33.7	28.2	< 0.01	0.96
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	24.8	25.4	<0.01	0.97
CO <sub>2</sub> Emissions from Waste Combustion	CO <sub>2</sub>	10.9	20.9	<0.01	0.97
HFC-23 Emissions from HCFC-22 Production	HFCs	35.0	16.5	<0.01	0.97
CO <sub>2</sub> Emissions from Land Converted to Grassland	CO <sub>2</sub>	14.6	16.3	<0.01	0.97
CO <sub>2</sub> Emissions from Ammonia Production and Urea Application	CO <sub>2</sub>	19.3	16.3	<0.01	0.98
CO <sub>2</sub> Emissions from Grassland Remaining Grassland	CO <sub>2</sub>	0.1	16.1	<0.01	0.98
N <sub>2</sub> O Emissions from Nitric Acid Production	N <sub>2</sub> O	17.8	15.7	<0.01	0.98
Non-CO <sub>2</sub> Emissions from Stationary Combustion	N <sub>2</sub> O	12.3	13.8	<0.01	0.98
CO <sub>2</sub> Emissions from Lime Manufacture	CO <sub>2</sub>	11.3	13.7	<0.01	0.98
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	SF <sub>6</sub>	27.1	13.2	<0.01	0.98
CH <sub>4</sub> Emissions from Forest Land Remaining Forest Land	CH <sub>4</sub>	7.1	11.6	<0.01	0.99
N <sub>2</sub> O Emissions from Manure Management	N <sub>2</sub> O	8.6	9.5	<0.01	0.99
CO2 Emissions from Landfilled Yard Trimmings and Food	CO <sub>2</sub>	22.8	8.8	<0.01	0.99
Scraps	CO <sub>2</sub>	22.0	0.0	<b>\0.01</b>	0.55
N₂O Emissions from Wastewater	$N_2O$	6.4	8.0	<0.01	0.99
	CO <sub>2</sub>	5.5	7.4	<0.01	0.99
CO <sub>2</sub> Emissions from Limestone and Dolomite Use CO <sub>2</sub> Emissions from Land Converted to Cropland		8.7	7.4	<0.01	0.99
	CO <sub>2</sub>				
Non-CO <sub>2</sub> Emissions from Stationary Combustion	CH <sub>4</sub>	8.0	6.9	< 0.01	0.99
CH <sub>4</sub> Emissions from Rice Cultivation	CH₄	7.1	6.9	< 0.01	0.99
N <sub>2</sub> O Emissions from Adipic Acid Production	N <sub>2</sub> O	15.2	6.0	< 0.01	0.99
N <sub>2</sub> O Emissions from Settlements Remaining Settlements	N <sub>2</sub> O	5.1	5.8	< 0.01	0.99
Fugitive Emissions from Abandoned Coal Mines	CH <sub>4</sub>	6.0	5.5	<0.01	0.99
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor	SF <sub>6</sub>	2.9	4.3	<0.01	1.00
Manufacture					
N <sub>2</sub> O Emissions from N <sub>2</sub> O Product Usage	N <sub>2</sub> O	4.3	4.3	<0.01	1.00
CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption	$CO_2$	4.1	4.2	<0.01	1.00
CO <sub>2</sub> Emissions from Aluminum Production	CO <sub>2</sub>	6.8	4.2	<0.01	1.00
PFC Emissions from Aluminum Production	PFCs	18.5	3.0	<0.01	1.00
CO <sub>2</sub> Emissions from Petrochemical Production	$CO_2$	2.2	2.9	<0.01	1.00
SF <sub>6</sub> Emissions from Magnesium Production and Processing	$SF_6$	5.4	2.7	<0.01	1.00
Mobile Combustion: Road & Other	CH <sub>4</sub>	4.5	2.4	<0.01	1.00
CO <sub>2</sub> Emissions from Titanium Dioxide Production	$CO_2$	1.3	1.9	<0.01	1.00
Mobile Combustion: Aviation	$N_2O$	1.7	1.8	<0.01	1.00
N <sub>2</sub> O Emissions from Forest Land Remaining Forest Land	$N_2O$	0.8	1.5	<0.01	1.00
CO <sub>2</sub> Emissions from Ferroalloy Production	CO <sub>2</sub>	2.2	1.4	<0.01	1.00

TOTAL		6972.4	8135.5	1.00	
CH <sub>4</sub> Emissions from Ferroalloy Production	CH <sub>4</sub>	+	+	<0.01	1.00
Consumption					
CH <sub>4</sub> Emissions from Silicon Carbide Production and	CH <sub>4</sub>	+	+	<0.01	1.00
Mobile Combustion: Marine	CH <sub>4</sub>	0.1	0.1	<0.01	1.00
Mobile Combustion: Aviation	CH <sub>4</sub>	0.2	0.1	< 0.01	1.00
Consumption					
CO <sub>2</sub> Emissions from Silicon Carbide Production and	CO <sub>2</sub>	0.4	0.2	<0.01	1.00
CO <sub>2</sub> Emissions from Lead Production	$CO_2$	0.3	0.3	<0.01	1.00
Energy	- 32	•••			
CO <sub>2</sub> Emissions from Stationary Combustion - Geothermal	CO <sub>2</sub>	0.4	0.4	< 0.01	1.00
N <sub>2</sub> O Emissions from Waste Combustion	$N_2O$	0.5	0.4	< 0.01	1.00
CO <sub>2</sub> Emissions from Zinc Production	$CO_2$	0.9	0.5	< 0.01	1.00
Mobile Combustion: Marine	$N_2O$	0.4	0.5	< 0.01	1.00
N <sub>2</sub> O Emissions from Field Burning of Agricultural Residues	$N_2O$	0.4	0.5	< 0.01	1.00
CH <sub>4</sub> Emissions from Field Burning of Agricultural Residues	CH <sub>4</sub>	0.7	0.9	< 0.01	1.00
CH <sub>4</sub> Emissions from Iron and Steel Production	CH <sub>4</sub>	1.3	1.0	< 0.01	1.00
CH <sub>4</sub> Emissions from Petrochemical Production	CH <sub>4</sub>	0.9	1.1	<0.01	1.00
CO <sub>2</sub> Emissions from Carbon Dioxide Consumption	$CO_2$	1.4	1.3	<0.01	1.00
CO <sub>2</sub> Emissions from Phosphoric Acid Production	$CO_2$	1.5	1.4	<0.01	1.00

Table A- 8: 1990-2005 Key Source Category Tier 1 Analysis—Trend Assessment, without LULUCF

Table A- 8: 1990-2005 Key Source Catego	. <b>y</b> 1101		1 CHA 133033111	ong without	Percent	Cumulative
	Direct	1990 Estimate	2005 Estimate	Trend	Contribution to	Contribution
IPCC Source Categories	GHG	(Tg CO <sub>2</sub> Eq.)	(Tg CO <sub>2</sub> Eq.)	Assessment	Trend (%)	to Trend (%)
Mobile Combustion: Road & Other	CO <sub>2</sub>	1237.2	1642.9	0.02		21
Emissions from Substitutes for Ozone Depleting	Several	0.3	123.3	0.01	12.5	33
Substances						
CO <sub>2</sub> Emissions from Stationary Combustion - Coal		1699.0	2093.6	0.01	12.1	45
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	161.0	132.0	0.01	5.6	51
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	CO <sub>2</sub>	585.4	626.3	0.01	5.5	57
CO <sub>2</sub> Emissions from Iron and Steel Production	CO <sub>2</sub>	84.9	45.2	0.01	5.5	62
Direct N₂O Emissions from Agricultural Soil Management	N <sub>2</sub> O	310.1	310.5	0.01	5.1	67
Fugitive Emissions from Coal Mining	CH₄	81.9	52.4	0.01	4.4	72
Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	124.5	111.1	<0.01	3.4	75
HFC-23 Emissions from HCFC-22 Production	HFCs	35.0	16.5	<0.01	2.5	77
Mobile Combustion: Aviation	CO <sub>2</sub>	180.0	186.1	<0.01	2.4	80
CH <sub>4</sub> Emissions from Enteric Fermentation	CH <sub>4</sub>	115.7	112.1	<0.01	2.3	82
PFC Emissions from Aluminum Production	PFCs	18.5	3.0	<0.01	1.9	84
SF <sub>6</sub> Emissions from Electrical Transmission and Distribution	SF <sub>6</sub>	27.1	13.2	<0.01	1.9	86
Mobile Combustion: Road & Other	$N_2O$	41.6	35.7	<0.01	1.3	87
N <sub>2</sub> O Emissions from Adipic Acid Production	$N_2O$	15.2	6.0	<0.01	1.2	88
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	34.4	28.5	<0.01	1.2	89
Indirect N <sub>2</sub> O Emissions from Applied Nitrogen	$N_2O$	56.8	54.6	<0.01	1.2	91
CO <sub>2</sub> Emissions from Natural Gas Systems	CO <sub>2</sub>	33.7	28.2	<0.01	1.1	92
Mobile Combustion: Marine	$CO_2$	46.8	63.7	<0.01	1.0	93
CO <sub>2</sub> Emissions from Waste Combustion	CO <sub>2</sub>	10.9	20.9	<0.01	8.0	94
CO <sub>2</sub> Emissions from Cement Manufacture	$CO_2$	33.3	45.9	<0.01	0.7	94
CO <sub>2</sub> Emissions from Ammonia Production and Urea Application	CO <sub>2</sub>	19.3	16.3	<0.01	0.6	95
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	CO <sub>2</sub>	117.3	142.4	<0.01	0.6	96
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>	30.9	41.3	<0.01	0.5	96
N <sub>2</sub> O Emissions from Nitric Acid Production	$N_2O$	17.8	15.7	<0.01	0.5	97
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	$CO_2$	975.4	1138.2	<0.01	0.4	97
CO <sub>2</sub> Emissions from Aluminum Production	$CO_2$	6.8	4.2	<0.01	0.4	97
SF <sub>6</sub> Emissions from Magnesium Production and Processing	SF <sub>6</sub>	5.4	2.7	<0.01	0.4	98
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	24.8	25.4	<0.01	0.3	98
Mobile Combustion: Road & Other	CH <sub>4</sub>	4.5	2.4	<0.01	0.3	98

$CH_4$ Emissions from Rice Cultivation $CH_4$ 7.1 6.9 <0.01 0.1 $CO_2$ Emissions from Ferroalloy Production $CO_2$ 2.2 1.4 <0.01 0.1 $CO_2$ Emissions from Limestone and Dolomite Use $CO_2$ 5.5 7.4 <0.01 0.1	99 99 99 99 99 99 99
$CO_2$ Emissions from Ferroalloy Production $CO_2$ 2.2 1.4 <0.01 0.1 $CO_2$ Emissions from Limestone and Dolomite Use $CO_2$ 5.5 7.4 <0.01 0.1 PFC, HFC, and SF <sub>6</sub> Emissions from $SF_6$ 2.9 4.3 <0.01 0.1	99 99 99 99 99
CO <sub>2</sub> Emissions from Limestone and Dolomite Use $CO_2$ 5.5 7.4 <0.01 0.1 PFC, HFC, and SF <sub>6</sub> Emissions from SF <sub>6</sub> 2.9 4.3 <0.01 0.1	99 99 99 99 99
PFC, HFC, and SF <sub>6</sub> Emissions from $SF_6$ 2.9 4.3 <0.01 0.1	99 99 99 99
	99 99 99
	99 99
	99 99
N₂O Emissions from N₂O Product Usage N₂O 4.3 4.3 <0.01 0.1	99
$CO_2$ Emissions from Zinc Production $CO_2$ 0.9 0.5 <0.01 0.1	
$N_2O$ Emissions from Wastewater $N_2O$ 6.4 8.0 <0.01 0.1	100
$CO_2$ Emissions from Soda Ash Manufacture and $CO_2$ 4.1 4.2 <0.01 0.1 1	
Consumption	
CH <sub>4</sub> Emissions from Iron and Steel Production CH <sub>4</sub> 1.3 1.0 <0.01 0.1 1	100
CO <sub>2</sub> Emissions from Lime Manufacture CO <sub>2</sub> 11.3 13.7 <0.01 0.1 1	100
$N_2O$ Emissions from Manure Management $N_2O$ 8.6 9.5 < 0.01 0.1 1	100
	100
	100
	100
	100
	100
CO <sub>2</sub> Emissions from Silicon Carbide Production CO <sub>2</sub> 0.4 0.2 <0.01 0.0 1	100
and Consumption	
	100
$N_2O$ Emissions from Waste Combustion $N_2O$ 0.5 0.4 <0.01 0.0 1	100
CO <sub>2</sub> Emissions from Stationary Combustion - CO <sub>2</sub> 0.4 0.4 <0.01 0.0 1	100
Geothermal Energy	
CH <sub>4</sub> Emissions from Petrochemical Production CH <sub>4</sub> 0.9 1.1 <0.01 0.0 1	100
$N_2O$ Emissions from Field Burning of Agricultural $N_2O$ 0.4 0.5 <0.01 0.0 1	100
Residues	
	100
$CO_2$ Emissions from Lead Production $CO_2$ 0.3 0.3 <0.01 0.0 1	100
CH <sub>4</sub> Emissions from Field Burning of Agricultural CH <sub>4</sub> 0.7 0.9 <0.01 0.0 1	100
Residues	
Mobile Combustion: Aviation CH <sub>4</sub> 0.2 0.1 < 0.01 0.0 1	100
CH <sub>4</sub> Emissions from Silicon Carbide Production CH <sub>4</sub> + + <0.01 0.0 1	100
and Consumption	
	100
CH <sub>4</sub> Emissions from Ferroalloy Production CH <sub>4</sub> + + <0.01 0.0 1	100
TOTAL 6229.0 7241.5 0.12	

Note: LULUCF sources and sinks are not included in this analysis.

Table A- 9: 1990-2005 Key Source Category Tier 1 Analysis—Trend Assessment, with LULUCF

Table N 7. 1770 2000 Key Source outeg					Percent	Cumulative
	Direct	1990 Estimate	2005 Estimate	Trend	Contribution to	Contribution
IPCC Source Categories	GHG	(Tg CO <sub>2</sub> Eq.)	(Tg CO <sub>2</sub> Eq.)	Assessment	Trend (%)	to Trend (%)
Mobile Combustion: Road & Other	CO <sub>2</sub>	1237.2	1642.9	0.02	19.1	19
Emissions from Substitutes for Ozone Depleting Substances	Several	0.3	123.3	0.01	11.8	31
CO <sub>2</sub> Emissions from Stationary Combustion - Coal	CO <sub>2</sub>	1699.0	2093.6	0.01	10.7	42
CO <sub>2</sub> Emissions from Stationary Combustion - Oil	CO <sub>2</sub>	585.4	626.3	0.01	5.5	47
CH <sub>4</sub> Emissions from Landfills	CH <sub>4</sub>	161.0	132.0	0.01	5.4	52
CO <sub>2</sub> Emissions from Iron and Steel Production	CO <sub>2</sub>	84.9	45.2	0.01	5.2	58
Direct N2O Emissions from Agricultural Soil Management	N <sub>2</sub> O	310.1	310.5	0.01	4.9	63
Fugitive Emissions from Coal Mining	CH <sub>4</sub>	81.9	52.4	<0.01	4.1	67
Fugitive Emissions from Natural Gas Systems	CH <sub>4</sub>	124.5	111.1	<0.01	3.3	70
HFC-23 Emissions from HCFC-22 Production	HFCs	35.0	16.5	<0.01	2.3	72
Mobile Combustion: Aviation	CO <sub>2</sub>	180.0	186.1	<0.01	2.3	75
CH <sub>4</sub> Emissions from Enteric Fermentation	CH <sub>4</sub>	115.7	112.1	<0.01	2.2	77
CO <sub>2</sub> Emissions from Settlements Remaining Settlements	CO <sub>2</sub>	57.5	88.5	<0.01	2.1	79

PFC Emissions from Aluminum Production SF <sub>6</sub> Emissions from Electrical Transmission and	PFCs SF <sub>6</sub>	18.5 27.1	3.0 13.2	<0.01 <0.01	1.8 1.8	81 82
Distribution CO <sub>2</sub> Emissions from Landfilled Yard Trimmings	CO <sub>2</sub>	22.8	8.8	<0.01	1.7	84
and Food Scraps CO <sub>2</sub> Emissions from Grassland Remaining	CO <sub>2</sub>	0.1	16.1	<0.01	1.5	86
Grassland						
Mobile Combustion: Road & Other	N <sub>2</sub> O	41.6	35.7	<0.01	1.2	87
Indirect N <sub>2</sub> O Emissions from Applied Nitrogen	$N_2O$	56.8	54.6	<0.01	1.1	88
N <sub>2</sub> O Emissions from Adipic Acid Production	$N_2O$	15.2	6.0	<0.01	1.1	89
Fugitive Emissions from Petroleum Systems	CH <sub>4</sub>	34.4	28.5	<0.01	1.1	90
CO <sub>2</sub> Emissions from Natural Gas Systems	$CO_2$	33.7	28.2	<0.01	1.1	91
Mobile Combustion: Marine	CO <sub>2</sub>	46.8	63.7	<0.01	0.9	92
CO <sub>2</sub> Emissions from Waste Combustion	CO <sub>2</sub>	10.9	20.9	<0.01	0.8	93
<del>-</del>						94
CO <sub>2</sub> Emissions from Cement Manufacture	CO <sub>2</sub>	33.3	45.9	<0.01	0.7	
CO <sub>2</sub> Emissions from Cropland Remaining	CO <sub>2</sub>	28.1	39.4	<0.01	0.6	94
Cropland						
CO <sub>2</sub> Emissions from Ammonia Production and Urea Application	CO <sub>2</sub>	19.3	16.3	<0.01	0.6	95
CO <sub>2</sub> Emissions from Non-Energy Use of Fuels	$CO_2$	117.3	142.4	<0.01	0.5	95
CH <sub>4</sub> Emissions from Manure Management	CH <sub>4</sub>	30.9	41.3	<0.01	0.5	96
N <sub>2</sub> O Emissions from Nitric Acid Production	$N_2O$	17.8	15.7	< 0.01	0.5	96
CO <sub>2</sub> Emissions from Aluminum Production	CO <sub>2</sub>	6.8	4.2	<0.01	0.4	97
SF <sub>6</sub> Emissions from Magnesium Production and	SF <sub>6</sub>	5.4	2.7	<0.01	0.4	97
Processing						
CH <sub>4</sub> Emissions from Wastewater Treatment	CH <sub>4</sub>	24.8	25.4	<0.01	0.3	97
CH₄ Emissions from Forest Land Remaining Forest Land	CH <sub>4</sub>	7.1	11.6	<0.01	0.3	98
CO <sub>2</sub> Emissions from Land Converted to Cropland	$CO_2$	8.7	7.2	<0.01	0.3	98
Mobile Combustion: Road & Other	CH <sub>4</sub>	4.5	2.4	<0.01	0.3	98
Non- CO <sub>2</sub> Emissions from Stationary Combustion	CH <sub>4</sub>	8.0	6.9	< 0.01	0.2	99
Fugitive Emissions from Abandoned Coal Mines	CH <sub>4</sub>	6.0	5.5	< 0.01	0.1	99
CH <sub>4</sub> Emissions from Rice Cultivation	CH <sub>4</sub>	7.1	6.9	<0.01	0.1	99
	CO <sub>2</sub>	2.2	1.4	<0.01	0.1	99
CO <sub>2</sub> Emissions from Ferroalloy Production						
CO <sub>2</sub> Emissions from Limestone and Dolomite Use	CO <sub>2</sub>	5.5	7.4	<0.01	0.1	99
PFC, HFC, and SF <sub>6</sub> Emissions from Semiconductor Manufacture	SF <sub>6</sub>	2.9	4.3	<0.01	0.1	99
N <sub>2</sub> O Emissions from N <sub>2</sub> O Product Usage	$N_2O$	4.3	4.3	<0.01	0.1	99
CO <sub>2</sub> Emissions from Land Converted to Grassland	$CO_2$	14.6	16.3	<0.01	0.1	99
CO <sub>2</sub> Emissions from Zinc Production	$CO_2$	0.9	0.5	< 0.01	0.1	99
N <sub>2</sub> O Emissions from Forest Land Remaining	N <sub>2</sub> O	0.8	1.5	< 0.01	0.1	99
Forest Land						
CO <sub>2</sub> Emissions from Soda Ash Manufacture and Consumption	CO <sub>2</sub>	4.1	4.2	<0.01	0.1	99
CH <sub>4</sub> Emissions from Iron and Steel Production	CH <sub>4</sub>	1.3	1.0	< 0.01	0.1	99
N <sub>2</sub> O Emissions from Wastewater	N <sub>2</sub> O	6.4	8.0	<0.01	0.1	100
Non- CO <sub>2</sub> Emissions from Stationary Combustion	N <sub>2</sub> O	12.3	13.8	<0.01	0.1	100
•	N <sub>2</sub> O	8.6	9.5	<0.01	0.1	100
N <sub>2</sub> O Emissions from Manure Management						
CO <sub>2</sub> Emissions from Lime Manufacture	CO <sub>2</sub>	11.3	13.7	<0.01	0.0	100
CO <sub>2</sub> Emissions from Phosphoric Acid Production	$CO_2$	1.5	1.4	<0.01	0.0	100
CO <sub>2</sub> Emissions from Titanium Dioxide Production	$CO_2$	1.3	1.9	<0.01	0.0	100
CO <sub>2</sub> Emissions from Forest Land Remaining Forest Land	CO <sub>2</sub>	598.5	698.7	<0.01	0.0	100
CO <sub>2</sub> Emissions from Carbon Dioxide Consumption	CO <sub>2</sub>	1.4	1.3	<0.01	0.0	100
CO <sub>2</sub> Emissions from Petrochemical Production	CO <sub>2</sub>	2.2				100
			2.9	<0.01	0.0	
CO <sub>2</sub> Emissions from Silicon Carbide Production	$CO_2$	0.4	0.2	<0.01	0.0	100
and Consumption						
Mobile Combustion: Aviation	$N_2O$	1.7	1.8	<0.01	0.0	100
N <sub>2</sub> O Emissions from Settlements Remaining Settlements	N <sub>2</sub> O	5.1	5.8	<0.01	0.0	100
N <sub>2</sub> O Emissions from Waste Combustion	$N_2O$	0.5	0.4	< 0.01	0.0	100
CO <sub>2</sub> Emissions from Stationary Combustion - Gas	CO <sub>2</sub>	975.4	1138.2	<0.01	0.0	100
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CO <sub>2</sub> Emissions from Stationary Combustion - Geothermal Energy	CO <sub>2</sub>	0.4	0.4	<0.01	0.0	100
N <sub>2</sub> O Emissions from Field Burning of Agricultural	$N_2O$	0.4	0.5	<0.01	0.0	100
Residues						
CH <sub>4</sub> Emissions from Petrochemical Production	CH <sub>4</sub>	0.9	1.1	<0.01	0.0	100
CO <sub>2</sub> Emissions from Lead Production	$CO_2$	0.3	0.3	<0.01	0.0	100
Mobile Combustion: Marine	$N_2O$	0.4	0.5	<0.01	0.0	100
CH <sub>4</sub> Emissions from Field Burning of Agricultural	CH <sub>4</sub>	0.7	0.9	<0.01	0.0	100
Residues						
Mobile Combustion: Aviation	CH <sub>4</sub>	0.2	0.1	<0.01	0.0	100
CH <sub>4</sub> Emissions from Silicon Carbide Production and Consumption	CH <sub>4</sub>	+	+	<0.01	0.0	100
Mobile Combustion: Marine	CH <sub>4</sub>	0.1	0.1	<0.01	0.0	100
CH <sub>4</sub> Emissions from Ferroalloy Production	CH <sub>4</sub>	+	+	<0.01	0.0	100
Total		6972.4	8135.5	0.1	100.0	

## References

Flugsrud, K., W. Irving, and K. Rypdal (1999) Methodological Choice in Inventory Preparation. Suggestions for Good Practice Guidance. Statistics Norway Department of Economic Statistics. 1999/19.

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